

CLAIMS

What is claimed is:

- 5 1. A dissection tool, comprising:
 a handle having a proximal end and a distal end;
 an elongated dissecting member having a proximal end and a distal end, the
 elongated dissecting member extending from the distal end of the handle; and
 a fluid channel system extending from at least the proximal end of the
10 elongated dissecting member to the distal end of the elongated dissecting member,
 the fluid channel system configured for one or both of fluid transport and aspiration
 between at least the proximal and distal ends of the elongated dissecting member.
2. The dissection tool of claim 1, wherein the fluid channel system
15 comprises a port system, the port system comprising a plurality of apertures.
3. The dissection tool of claim 1, wherein the fluid channel system
 comprises a port system, the port system comprising at least one aperture and at
 least one aperture cover, the aperture cover hingedly mounted at the distal end of
20 the elongated dissecting member and moveable between a closed orientation and an
 open orientation relative to the aperture.
4. The dissection tool of claim 1, wherein the fluid channel system
 comprises a port system and a manifold disposed between the fluid channel system
25 and the port system, the manifold adapted to distribute a fluid between the fluid
 channel system and the port system.

5. The dissection tool of claim 1, wherein the fluid channel system comprises a plurality of channels terminating in a plurality of apertures, wherein each channel terminates in a single opening.

5 6. The dissection tool of claim 1, wherein the fluid channel system comprises a plurality of channels terminating in a plurality of apertures, wherein at least one of the channels terminates in a second plurality of apertures.

7. The dissection tool of claim 1, wherein the elongated dissecting
10 member is curved.

8. The dissection tool of claim 7, wherein the curvature of the elongated dissecting member is defined by a single radii.

15 9. The dissection tool of claim 7, wherein the curvature of the elongated dissecting member is defined by multiple radii.

10 10. The dissection tool of claim 7, wherein the curvature of the elongated dissecting member has a radius of curvature ranging from about 25 centimeters to about 2.5 centimeters.

11. The dissection tool of claim 1, wherein the fluid channel system is adapted to transport an irrigation fluid.

25 12. The dissection tool of claim 1, wherein the fluid delivery system is adapted to transport a pharmacological agent.

13. The dissection tool of claim 1, wherein the fluid channel system comprises a first fluid channel and a second fluid channel, the first fluid channel adapted to transport an irrigation fluid and the second fluid channel adapted to transport a pharmacological agent.

5

14. The dissection tool of claim 1, wherein the fluid channel system is adapted to transport an analgesic or an anesthetic.

15. The dissection tool of claim 1, wherein the fluid channel system is adapted to transport an antibiotic or an antiseptic.

10

16. The dissection tool of claim 1, wherein the fluid channel system is adapted to transport an anti-inflammatory agent.

15

17. The dissection tool of claim 1, wherein the fluid channel system is adapted to transport a fluid comprising an agent that improves hemostasis or an agent that accelerates healing.

20

18. The dissection tool of claim 1, wherein the fluid channel system is adapted to transport a fluid comprising an agent that enhances electrical properties of tissue.

19. A dissection system, comprising:

a pump;

a fluid reservoir adapted to provide a fluid to the pump;

a tube; and

5 a dissection tool, comprising:

a handle having a proximal end and a distal end;

an elongated dissecting member having a proximal end and a distal end, the elongated dissecting member extending from the distal end of the handle; and

10 a fluid channel system extending from at least the proximal end of the elongated dissecting member to the distal end of the elongated dissecting member, wherein the tube fluidly connects the dissection tool with the pump.

20. The dissection system of claim 19, wherein the fluid channel system
15 comprises a port system, the port system comprising a plurality of apertures.

21. The dissection system of claim 20, further comprising a manifold disposed between the fluid channel system and the port system, the manifold adapted to distribute fluid between the fluid channel system and the port system.

20

22. The dissection system of claim 19, wherein the port system comprises at least one aperture and at least one aperture cover, the aperture cover hingedly mounted to the distal end of the elongated dissecting member and moveable between a closed orientation and an open orientation relative to the aperture.

25

23. The dissection system of claim 22, wherein the aperture cover is movable from the closed orientation to the open orientation in response to delivery of the fluid through the fluid channel system at a pressure that exceeds a pressure exerted on the aperture cover by surrounding tissue.

5

24. The dissection system of claim 19, wherein the fluid channel system comprises a plurality of channels each terminating in a single aperture or a plurality of apertures.

10

25. The dissection system of claim 19, wherein the pump comprises a pump controller actuatable by a clinician to control dispensing of the fluid from the fluid reservoir to the dissection tool.

15

26. The dissection system of claim 19, wherein the fluid channel system comprises a first fluid channel and a second fluid channel, the first fluid channel adapted to transport an irrigation fluid and the second fluid channel adapted to transport a pharmacological agent.

20

27. The dissection system of claim 19, further comprising a sheath removably displaceable over the elongated dissecting member.

28. The dissection system of claim 19, wherein the fluid comprises an irrigation fluid.

25

29. The dissection system of claim 19, wherein the fluid comprises a pharmacological agent.

30. The dissection system of claim 19, wherein the fluid comprises an analgesic or an anesthetic.

5 31. The dissection system of claim 19, wherein the fluid comprises an antibiotic or an antiseptic.

32. The dissection system of claim 19, wherein the fluid comprises an anti-inflammatory agent.

10 33. A method of dissecting subcutaneous tissue, comprising:
providing a dissection tool having a fluid delivery system;
dissecting subcutaneous tissue with the dissection tool; and
delivering a fluid from the dissection tool during subcutaneous tissue
dissection via the fluid delivery system.

15

34. The method of claim 33, wherein the dissection is performed only in a subcutaneous tissue plane.

20 35. The method of claim 33, wherein a plane of dissection follows a curvature of the rib cage.

36. The method of claim 33, wherein the dissection tool further comprises a curved elongated dissecting member.

25 37. The method of claim 33, wherein delivering the fluid comprises dispensing the fluid from a single dissection tool location.

38. The method of claim 33, wherein delivering the fluid comprises dispensing the fluid from multiple dissection tool locations.

5 39. The method of claim 33, further comprising limiting entry of dissected tissue or other debris into the fluid delivery system as the dissection tool is advanced through the subcutaneous tissue.

40. The method of claim 33, further comprising aspirating fluids or other debris from the fluid delivery system.
10

41. The method of claim 33, wherein delivering the fluid comprises delivering an irrigation fluid.

42. The method of claim 33, wherein delivering the fluid comprises
15 delivering a pharmacological agent.

43. The method of claim 33, wherein delivering the fluid comprises delivering a gas.

20 44. The method of claim 33, wherein delivering the fluid comprises delivering an analgesic or an anesthetic.

45. The method of claim 33, wherein delivering the fluid comprises delivering an antibiotic or an antiseptic.
25

46. The method of claim 33, wherein delivering the fluid comprises delivering an anti-inflammatory agent.

47. A method of implanting subcutaneous electrodes, comprising:
providing a dissection tool having a fluid delivery channel;
dissecting subcutaneous tissue with the dissection tool to create a path in the
subcutaneous tissue;
5 delivering a fluid from the dissection tool during subcutaneous tissue
dissection; and
delivering one or more electrodes into the subcutaneous tissue path.

48. The method of claim 47, wherein the dissection is performed only in a
10 subcutaneous tissue plane.

49. The method of claim 47, wherein a plane of dissection follows a
curvature of the rib cage.

15 50. The method of claim 47, further comprising delivering a housing into
the subcutaneous tissue path, wherein the housing matingly connects with the one or
more electrodes.

51. The method of claim 47, further comprising advancing a sheath into the
20 subcutaneous tissue path.

52. The method of claim 51, wherein the sheath is advanced into the
subcutaneous tissue path during subcutaneous tissue dissection.

25 53. The method of claim 51, further comprising delivering the one or more
electrodes into the subcutaneous tissue path via the sheath.

54. The method of claim 51, wherein the dissection tool further comprises a lead lumen, the method further comprising delivering a lead to a subcutaneous body location via the lead lumen of the dissection tool.

5 55. The method of claim 51, further comprising aspirating fluid or debris through the fluid delivery channel or through a second fluid delivery channel of the dissection tool fluidly isolated from the fluid delivery channel.

56. The method of claim 47, wherein delivering the fluid comprises
10 dispensing the fluid from a single dissection tool location or from multiple dissection tool locations.

57. The method of claim 47, further comprising limiting entry of dissected tissue or other debris into the fluid delivery system as the dissection tool is advanced
15 through the subcutaneous tissue.

58. The method of claim 47, wherein delivering the fluid comprises delivering an irrigation fluid.

20 59. The method of claim 47, wherein delivering the fluid comprises delivering a pharmacological agent.

60. The method of claim 47, wherein the fluid delivery channel is adapted to transport an analgesic or an anesthetic.

25

61. The method of claim 47, wherein the fluid delivery channel is adapted to transport an antibiotic or an antiseptic.

62. The method of claim 47, wherein the fluid delivery channel is adapted to transport an anti-inflammatory agent.

63. A dissection tool, comprising:
5 a handle having a proximal end and a distal end;
means, attached to the distal end of the handle, for dissecting
subcutaneous tissue; and
means for delivering a fluid through or along the dissecting means and
to tissue subject to dissection.

10 64. The dissection tool of claim 63, further comprising means for limiting
entry of dissected tissue or other debris into the fluid delivery means as the
dissection tool is advanced through the subcutaneous tissue.

15 65. The dissection tool of claim 63, wherein the dissecting means
comprises one or more curved portions.

66. The dissection tool of claim 63, wherein the fluid delivering means
comprises a fluid distribution manifold.

20 67. The dissection tool of claim 63, further comprising means for
controllably dispensing the fluid to the fluid delivering means.

25 68. The dissection tool of claim 63, wherein the delivering means is
adapted to transport an analgesic or an anesthetic.

69. The dissection tool of claim 63, wherein the delivering means is
adapted to transport an antibiotic or an antiseptic.

70. The dissection tool of claim 63, wherein the delivering means is adapted to transport an anti-inflammatory agent.

5 71. A kit, comprising:
 at least one subcutaneous dissection tool, the dissection tool comprising a
fluid channel system; and
 at least one subcutaneous electrode configured to be received by a
subcutaneous tissue tunnel producible by the at least one subcutaneous dissection
10 tool.

72. The kit according to claim 71, further comprising a fluid delivery system configured for coupling to the at least one dissection tool.

15 73. The kit according to claim 71, comprising an assortment of subcutaneous dissection tools having varying configurations.

74. The kit according to claim 71, comprising an assortment of subcutaneous dissection tools having elongated dissecting members of varying
20 curvature.

75. The kit according to claim 71, wherein the dissection tool comprises a handle section configured to accommodate a plurality of separable elongated dissecting members.
25

76. The kit according to claim 71, further comprising a sheath configured to be removably displaceable over an elongated dissecting member of the dissection tool.

77. The kit according to claim 71, further comprising an implantable medical device, a housing of the implantable medical device configured to be received by the subcutaneous tissue tunnel, the housing configured for coupling to the at least one subcutaneous electrode.

78. The kit according to claim 71, wherein the fluid channel system is adapted to transport an analgesic or an anesthetic.

79. The kit according to claim 71, wherein the fluid channel system is adapted to transport an antibiotic or an antiseptic.

80. The kit according to claim 71, wherein the fluid channel system is adapted to transport an anti-inflammatory agent.

81. A dissection tool, comprising:
a handle having a proximal end and a distal end;
an elongated dissecting member extending from the distal end of the handle,
the elongated dissecting member comprising:
a proximal end;
a distal end; and
a lead lumen extending between the proximal and distal ends; and
a fluid channel system extending between at least the proximal end of the elongated dissecting member and the distal end of the elongated dissecting member.

82. The dissection tool of claim 81, wherein the lead lumen is configured to receive a pacing lead.

83. The dissection tool of claim 81, wherein the lead lumen is configured to receive a defibrillator lead.

5 84. The dissection tool of claim 81, wherein the lead lumen is configured to receive a sensor lead.

85. The dissection tool of claim 81, wherein the fluid channel system further comprises a port system having a plurality of apertures.

10

86. The dissection system of claim 85, wherein the port system comprises a manifold, the manifold adapted to distribute the fluid between the fluid channel system and the plurality of apertures.

15 87. The dissection tool of claim 85, wherein the port system comprises at least one aperture and at least one aperture cover, the aperture cover hingedly mounted to the distal end of the elongated dissecting member and moveable between a closed orientation and an open orientation relative to the aperture.

20 88. The dissection tool of claim 81, wherein the fluid channel system comprises a plurality of channels terminating in a plurality of apertures, wherein each channel terminates in a single opening.

25 89. The dissection tool of claim 81, wherein the fluid channel system comprises a plurality of channels terminating in a plurality of apertures, wherein at least one of the channels terminates in a second plurality of apertures.

90. The dissection tool of claim 81, wherein the elongated dissecting member is curved.

5 91. The dissection tool of claim 81, wherein the fluid channel system is adapted to transport an irrigation fluid.

92. The dissection tool of claim 81, wherein the fluid delivery system is adapted to transport a pharmacological agent.

10 93. The dissection tool of claim 81, wherein the fluid delivery system is adapted for fluid transport and aspiration.

15 94. The dissection tool of claim 81, wherein the fluid channel system is adapted to transport an analgesic or an anesthetic.

95. The dissection tool of claim 81, wherein the fluid channel system is adapted to transport an antibiotic or an antiseptic.

20 96. The dissection tool of claim 81, wherein the fluid channel system is adapted to transport an anti-inflammatory agent.

25 97. A dissection system, comprising:
a pump;
a fluid reservoir adapted to provide a fluid to the pump;
an aspiration reservoir adapted to contain aspirant;
a tube; and
a dissection tool, comprising:
a handle having a proximal end and a distal end;

an elongated dissecting member having a proximal end and a distal end, the elongated dissecting member extending from the distal end of the handle; and

5 a fluid channel system extending from at least the proximal end of the elongated dissecting member to the distal end of the elongated dissecting member, wherein the tube fluidly connects the dissection tool with the fluid reservoir and the aspiration reservoir.

10 98. The dissection system of claim 97, wherein the fluid channel system comprises a port system, the port system comprising a plurality of apertures.

15 99. The dissection system of claim 97, further comprising a valve fluidly coupled to the fluid reservoir and the dissection tool, the valve adapted to fluidly couple the fluid channel system with a selected one of the fluid reservoir and the aspirant reservoir.

20 100. The dissection system of claim 97, wherein the pump comprises a pump controller actuatable by a clinician to control dispensing of the fluid from the fluid reservoir to the dissection tool or the aspiration of aspirant into the aspirant reservoir.

25 101. The dissection system of claim 97, wherein the fluid channel system comprises a first fluid channel and a second fluid channel, the first fluid channel adapted to transport an irrigation fluid and the second fluid channel adapted to transport a pharmacological agent.

102. The dissection system of claim 97, wherein the fluid comprises an irrigation fluid.

103. The dissection system of claim 97, wherein the fluid comprises a pharmacological agent.

5 104. The dissection system of claim 97, wherein the fluid comprises an analgesic or an anesthetic.

105. The dissection system of claim 97, wherein the fluid comprises an antibiotic or an antiseptic.

10

106. The dissection system of claim 97, wherein the fluid comprises an anti-inflammatory agent.